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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,578	10/23/2001	Edmund M. Carnahan	22,852	4596
22852	7590	04/20/2004	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 1300 I STREET, NW WASHINGTON, DC 20005			LEE, RIP A	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/869,578

Applicant(s)

CARNAHAN ET AL.

Examiner

Rip A. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on December 17, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

This office action follows a request for continued examination (RCE) under 37 § C.F.R. 1.114, filed on December 17, 2003. Claim 1 has been amended to include a drying step after each addition of catalyst component to silica. Claims 10-15 and 17 have been amended to correct matters of form. Claims 1, 2, and 4-20 remain.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1 and 5-16 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 5,783,512 to Jacobsen *et al.*

Jacobsen *et al.* teaches a process of making a supported olefin polymerization catalyst. The support material is silica (col. 14, line 42) having a pore volume of 0.1-3 cm<sup>3</sup>/g (col. 14, line 60) that has been subjected to heat and chemical treatment (col. 14, line 65). Thermal treatment at 100-1000 °C is sufficient to reduce the water content (col. 15, line 5). Chemical treatment involves combining the support with an organoaluminum compound (col. 15, line 13). Various permutations for combining catalyst components are offered in the text. In one aspect of the invention, a solution of ionizing activator is added to the support in such a manner that the solution volume does not exceed the pore volume of the support (col. 18, line 10). Following a

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drying step, the transition metal component may be added. Such a process is shown in Example 6. Here, calcined and  $\text{Et}_3\text{Al}$  treated silica is contacted with a solution of borate/TEA cocatalyst in a manner such that the solution volume corresponded roughly to the pore volume of silica (col. 23, line 64). Afterward, the mixture was agitated, resulting in dried powder (col. 23, line 66). Once dry, a solution of transition metal complex is added to provide a supported catalyst. According to the inventors, the supported catalyst thus formed may be stored or shipped in free flowing form under inert conditions upon removal of solvent (col. 18, lines 31-33). As such, the steps outlined in process claims 1 and 15 for making a catalyst are clearly disclosed in Jacobson *et al.*

Compounds corresponding to the general formula  $\text{L}_t\text{MX}_m\text{X}'_n\text{X}''_p$  are shown in the text in columns 11 and 12, and these are the compounds recited in present claims 5-9. Specific use of  $(\text{C}_5\text{Me}_4\text{SiMe}_2\text{NCMe}_3)\text{Ti}(\eta^4\text{-C}_5\text{H}_8)$  is illustrated in cited Example 6. As to the coactivators described in claims 10-14, there is discussion of ionic compounds of type  $[\text{L}^*\text{-H}]^+[\text{A}^d]^-$  (col. 8, line 12), ionic tetraborates  $[\text{L}^*\text{-H}]^+[\text{BQ}_4]^-$  (col. 8, lines 60-65), cationic oxidizing agents  $(\text{ox}^{e+})_d(\text{A}^{d-})_e$  (col. 9, line 13), and carbenium ion compounds  $\text{C}^+\text{A}^-$  and silylium compounds  $\text{R}_3\text{SiX}'(\text{A})$  (col. 9, lines 1-10).

Example 5 teaches treatment of a slurry of 40 g of calcined silica with 40 mL of  $\text{Et}_3\text{Al}$  in 250 mL of toluene (col. 23, lines 28-33). This equates to about 8.7 mmole of agent per gram of silica, and this ratio lies within the range set forth in claim 16. Afterward, the treated silica is washed and dried *in vacuo*.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 2, 4, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,783,512 to Jacobsen *et al.*

The discussion of the disclosures of the prior art from paragraph 2 of this office action is incorporated here by reference. The reference is silent with respect to the residual hydroxyl content of the silica upon thermal and chemical treatment. However, in view of the fact that the calcination steps outlined in the patent are essentially the same as those recited in the present claims, a reasonable basis exists to believe that the hydroxyl content lies within the claimed range. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. Similarly, the patent describes removal of solvent under reduced pressure under high vacuum (Example 5, col. 23, line 33), but the pressure

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is not recorded. However, in view of the fact that modern high vacuum lines are well capable of achieving reduced pressures within the claimed range, a reasonable basis exists to believe that the treated silica has been subjected the conditions recited in present claim 18(a). Again, the burden of proof rests with Applicants to establish an unobviousness difference with respect to this subject matter. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Although Jacobsen *et al.* teaches addition of the first solution in an amount not exceeding 100 % of the pore volume of silica, but the reference does not state specifically that the subsequent drying step is performed by heating or subjecting to reduced pressure. Instead, the reference states that the resulting product was “agitated.” This point notwithstanding, one of ordinary skill in the art would have found it obvious to remove solvent by heating or subjecting the support to reduced pressure since these are routine practice in the art. This is especially obvious since drying in vacuo is described in Example 5 in which silica is treated with  $\text{Et}_3\text{Al}$  and subsequently dried under vacuum. As such, the skilled artisan would have found it obvious to do the same in the step described in present claim 2.

Regarding claim 4, Jacobsen *et al.* does not teach examples in which a slurry of support precursor is formed prior to addition of catalyst components (C)(1) or (C)(2) *per se*. However, the inventors contemplate such a manipulation in col. 18, line 5, stating that “combining of component (a) may be carried out while forming a slurry.” Therefore, one having ordinary skill in the art would have found it obvious to make a slurry of silica prior to addition of component (a), exactly as prescribed in the text, and one would have expected such a step to result in the same supported catalyst.

6. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen *et al.*

The prior art catalyst is used for polymerization of one or more  $\alpha$ -olefins as discussed extensively in col. 19, and gas phase processes are taught in col. 20, lines 46-67. The gas phase process of the present claims is not described specifically in the prior art. However, the recited steps are unexceptional. In fact, Example 1 of Jacobsen *et al.* discloses a similar process for slurry polymerization in which a reaction vessel is charged with *i*Bu<sub>3</sub>Al and pressurized to 10 bar with monomer, after which an aliquot of catalyst is injected into the polymerization vessel. Upon completion of polymerization, the product is recovered (see col. 22, lines 31-44). Since these general steps are clearly set forth in the reference, As such, it is maintained that one of ordinary skill in the art would have found it obvious to use the same generic steps in a process of polymerizing olefin using the same catalyst, except in a gas phase process.

#### ***Response to Arguments***

7. All claim rejections based on WO 98/45337 to Peil *et al.*, set forth in paragraphs 3-5 of the previous office action, have been overcome by amendment.

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8. The prior art made of record but not relied upon is considered pertinent to the Applicant's disclosure. The following references have been cited to show the state of the art with respect to supported catalysts.

U.S. Patent No. 6,479,599 to Peil *et al.*

U.S. Patent No. 6,087,293 to Carnahan *et al.*

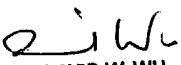
U.S. Patent No. 5,883,204 to Spencer *et al.*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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April 13, 2004

  
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